

## CLAIMS

What is claimed is:

1. An apparatus comprising:  
a gap detector receiving server information indicating which transactions transmitted by a client to a server through a computer communication network were processed by the server, and detecting gaps between the transmitted transactions and the processed transactions from the received server information, the gaps thereby indicating which of the transmitted transactions were not processed by the server.
2. An apparatus as in claim 1, wherein, when a gap is detected by the gap detector to thereby indicate that a transmitted transaction was not processed by the server, the client is notified that the transmitted transaction was not processed and then the client retransmits the transaction.
3. An apparatus as in claim 1, wherein the gap detector receives client information from the client indicating which transactions were transmitted by the client, and detects gaps between the transmitted transactions and the processed transactions in accordance with the received client information and the received server information, the apparatus further comprising:  
a first file in which the client stores the client information, the gap detector accessing the first file to thereby receive the client information; and  
a second file in which server stores the server information, the gap detector accessing the second file to thereby receive the server information.
4. An apparatus as in claim 3, further comprising:  
a third file in which the gap detector stores information indicating that a gap has been detected, the client accessing the third file to thereby be notified that a gap has been detected.
5. An apparatus as in claim 2, further comprising:  
a first file in which server stores the server information, the gap detector accessing the first file to thereby receive the server information; and  
a second file in which the gap detector stores information indicating that a gap has been detected and indicating which of the transmitted transactions were not processed, the client accessing the second file to thereby be notified which transmitted transactions

were not processed

6. An apparatus as in claim 1, further comprising:

a control information adder adding control information to each transaction transmitted by the client, the control information including a sequence number of the transmitted transaction; and

a control information remover removing control information from transmitted transactions received by the server to allow the server to process the transaction without the control information, the removed control information being used to determine the server information.

7. An apparatus as in claim 2, further comprising:

a control information adder adding control information to each transaction transmitted by the client, the control information including a sequence number of the transmitted transaction; and

a control information remover removing control information from transmitted transactions received by the server to allow the server to process the transaction without the control information, the removed control information being used to determine the server information.

8. An apparatus as in claim 2, further comprising:

a log in which the client logs transmitted transactions, the client accessing the log to retrieve and retransmit a respective transaction when the client is notified that the transmitted transaction was not processed.

9. An apparatus comprising:

a client adding sequence numbers to transactions, and then transmitting the transactions with the added sequence numbers;

a transaction log in which the client logs the transmitted transactions;

a server receiving the transmitted transactions with the added sequence numbers, removing the sequence numbers, and then processing the transactions with the removed sequence numbers;

a first file in which the server stores sequence numbers of transactions processed by the server;

a gap detector accessing the first file to receive the sequence numbers of the processed transactions, and, from the received sequence numbers, detecting whether there

is a gap between the sequence numbers of the transmitted transactions and the sequence numbers of processed transactions, a gap indicating that at least one transmitted transaction was not processed; and

a second file in which the gap detector stores information indicating the sequence number for each of said at least one transmitted transaction, wherein the client accesses the second file to thereby be notified of the sequence number of each of said at least one transmitted transaction, and then accesses the transaction log to obtain and then retransmit each of said at least one transmitted transaction.

10. An apparatus comprising:

a gap detector receiving server information indicating which transactions transmitted by clients to servers through a computer communication network were processed by the servers, and detecting gaps between the transmitted transactions and processed transactions from the received server information, the gaps thereby indicating which of the transmitted transactions were not processed by the servers.

11. An apparatus as in claim 10, wherein, when a gap is detected by the gap detector to thereby indicate that a respective transmitted transaction was not processed by a server, the client that originally transmitted the transaction is notified that the transmitted transaction was not processed and then the client retransmits the transaction.

12. An apparatus as in claim 10, further comprising:

server files in which the servers store the server information, the gap detector accessing the server files to thereby receive the server information.

13. An apparatus as in claim 12, further comprising:

a gap detector file in which the gap detector stores information indicating that a gap has been detected, the clients accessing the gap detector file to thereby be notified that a gap has been detected.

14. An apparatus as in claim 11, wherein the gap detector receives client information from the clients indicating which transactions were transmitted by the clients, and detects gaps between the transmitted transactions and the processed transactions from the received client information and the received server information, the apparatus further comprising:

client files in which the clients store the client information, the gap detector



removing the sequence numbers, and then processing the transactions with the removed sequence numbers;

server files in which the servers store sequence numbers of transactions processed by the servers;

a gap detector accessing the server files to receive the sequence numbers of the processed transactions, and, from the received sequence numbers, detecting whether there is a gap between the sequence numbers of the transmitted transactions and the sequence numbers of processed transactions, a gap indicating that at least one transmitted transaction was not processed; and

a gap detector file in which the gap detector stores information indicating the sequence number for each of said at least one transmitted transaction, the clients accessing the gap detector file to thereby be notified of the sequence number of each of said at least one transmitted transaction,

wherein, when a respective client is notified of a sequence number of a transaction transmitted by the client, the client accesses one of the transaction logs to obtain and then retransmit the transaction.

19. An apparatus comprising:

clients each having a corresponding client ID, each client adding its client ID and a sequence number to transactions transmitted by the respective client;

transaction logs in which the clients log the transmitted transactions;

servers receiving the transmitted transactions with the added client IDs and sequence numbers, removing the client IDs and sequence numbers, and then processing the transactions with the removed client IDs and sequence numbers;

server files in which the servers store information indicating the client ID and sequence number of each transaction processed by the servers;

a detector accessing the server files to receive the stored information, and, from the received information, detecting transmitted transactions which were not processed; and

a detector file in which the detector stores information indicating the client ID and sequence number for each of the detected transactions, the clients accessing the detector file to thereby be notified of the client IDs and sequence numbers of the detected transactions,

wherein, when a respective client is notified of a sequence number of a transaction transmitted by the client, the client accesses one of the transaction logs to obtain and then retransmit the transaction.

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20. An apparatus comprising:

a detector automatically receiving sequence numbers of transactions transmitted by a client to a server through a computer communication network and processed by the server, and, from the received sequence numbers, automatically detecting transmitted transactions which were not processed by the server, the client being notified of the detected transactions and then retransmitting the detected transactions.

21. An apparatus comprising:

means for automatically receiving sequence numbers of transactions transmitted by a client to a server through a computer communication network and processed by the server;

means for, from the received sequence numbers, automatically detecting transmitted transactions which were not processed by the server;

means for notifying the client of the detected transactions; and

means for, after being notified of the detected transactions, retransmitting the detected transactions by the client.

22. An apparatus comprising:

means for receiving sequence numbers of transactions transmitted by clients to servers through a computer communication network;

means for receiving sequence numbers of the transmitted transactions which were processed by the servers;

means for, from the received sequence numbers of transactions transmitted by clients and the received sequence numbers of the transmitted transactions which were processed by the servers, detecting transmitted transactions were not processed by the servers;

means for notifying the clients of the detected transactions; and

means for, after being notified of the detected transactions, retransmitting the detected transactions by the clients.

23. A computer-implemented method comprising:

automatically receiving sequence numbers of transactions transmitted by a client to a server through a computer communication network and processed by the server;

automatically, from the received sequence numbers, detecting transmitted transactions were not processed by the server;

automatically notifying the client of the detected transactions; and

after being notified of the detected transactions, automatically retransmitting the detected transactions by the client.

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